

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7092-1 (1992): Aluminium Alloy Tubes for Irrigation Purposes, Part 1: Welded Tubes [MTD 7: Light Metals and their Alloys]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



भारतीय मानक

सिंचाई प्रयोजनों के लिए ऐल्युमिनियम मिश्रधातु  
की नलिकाएँ — विशिष्ट

भाग 1 वेल्डित नलिकाएँ

( दूसरा पुनरीक्षण )

*Indian Standard*

ALUMINIUM ALLOY TUBES FOR IRRIGATION  
PURPOSES — SPECIFICATION

PART 1 WELDED TUBES

*( Second Revision )*

UDC 621.643-2 : 669-715-462 : 2 : 626.81/.85

© BIS 1992

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard ( Part 1 ) ( Second Revision ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Light Metals and Their Alloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This Standard was first published in 1973 and subsequently revised in 1976, when it was issued in two separate parts covering the requirements of welded and extruded tubes in Part 1 and Part 2 respectively. The present revision of Part 1 has been done in the light of experiences gained in the manufacture and usage of such tubes. In this revision following modifications have been done:

- a) Denting factor has been deleted;
- b) Table 1 on tolerances has been modified;
- c) Aluminium alloy tubes of 63 and 90 mm Nominal sizes have been included;
- d) A new clause on references has been incorporated;
- e) Definition of batch has been modified; and
- f) Marking clause has been modified.

This standard also contains a number of clauses ( 4.2, 8.2 and 10 ), where a purchaser is required to exercise his option.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***ALUMINIUM ALLOY TUBES FOR IRRIGATION PURPOSES — SPECIFICATION****PART 1 WELDED TUBES***( Second Revision )***1 SCOPE**

This standard covers the requirement of Electric resistance welded aluminium alloy tubes used for irrigation ( including sprinkler irrigation ) purposes and suitable for a maximum working pressure of 1 000 kN/m<sup>2</sup> ( 10 kgf/cm<sup>2</sup> ) for diameters up to and including 200 mm.

**2 REFERENCES**

The following Indian Standards are necessary adjuncts to this Standard:

| <i>IS No.</i>             | <i>Title</i>                                                                                                                 |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 504 : 1963                | Methods of chemical analysis of aluminium and its alloys ( <i>revised</i> )                                                  |
| 737 : 1986                | Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes ( <i>third revision</i> )             |
| 2328 : 1983               | Method for flattening test on metallic tubes ( <i>first revision</i> )                                                       |
| 2657 : 1964               | Method for tensile testing of aluminium and aluminium alloy tube                                                             |
| 5047<br>( Part 1 ) : 1986 | Glossary of terms relating to aluminium and aluminium alloys: Part 1 Unwrought and wrought metals ( <i>second revision</i> ) |
| 10259 : 1982              | General conditions of delivery and inspection of aluminium and aluminium alloy products.                                     |

**3 TERMINOLOGY**

**3.0** For the purpose of this standard, the definitions given in IS 5047 ( Part 1 ) : 1986 shall apply, except the definition of welded tube which shall be as per 3.1.

**3.1 Welded Tube**

Tube formed from sheet or strip with welded abutting edges.

**4 SUPPLY OF MATERIAL**

**4.1** General requirements relating to the supply of material shall conform to IS 10259 : 1982.

**4.2** The tube supplied shall be of aluminium alloy as specified by the purchaser (*see* 7.1 ). The temper of the welded tube shall be that of the sheet or strip ( except at the welded zone ) from which tube is formed.

**5 WORKMANSHIP AND FINISH**

**5.1** The tube shall be supplied in mill — finished condition and shall be of uniform quality and temper, clean, sound and free from harmful defects.

**5.2** The weld shall be flush with the sides and shall be uniform and free from harmful defects.

**5.3** The tube may be rectified by grinding for minor surface imperfections, provided dimensions are within the specified limits.

**5.4** A point of leakage in hydrostatic pressure test may be rectified by inert gas welding and grinding and shall not be the cause of rejection provided the tube so rectified passes the hydrostatic pressure test.

**6 SELECTION OF TEST SAMPLES****6.1 Batch**

The tube of the same composition, temper and dimensions produced in the same way at the same place shall be grouped in batches of 1 000 kg.

**6.2 Chemical Analysis, Tensile Test, Flattening Test**

One test piece each shall be taken from a tube selected at random to represent each batch for chemical analysis, tensile test and flattening test. Before test samples are cut off, they shall be marked to identify them with the batch they represent.

**6.2.1** The test piece shall be taken from the tube as supplied and shall not be subjected to any thermal or mechanical working ( except in the preparation of test piece before testing ).

**6.2.2** The tensile test piece shall be taken from the tube in the direction of the rolling, but away from weld zone.

### 6.3 Hydrostatic Pressure Test

All tubes shall be tested for hydrostatic pressure test.

## 7 REQUIREMENTS FOR THE MATERIAL

### 7.1 Chemical Composition

The chemical composition of the material shall comply with the composition requirements of alloys 31 000, 31 500, 40 800, 51 300, 52 000, 53 000 and 55 000 as specified in IS 737 : 1986.

**7.1.1** The chemical composition of the sample drawn according to 6.2, shall be determined either by the method specified in IS 504 : 1963 or any other established instrumental/chemical method. In case of dispute method specified in IS 504 : 1963 shall be the referee method.

### 7.2 Tensile Properties

The test piece ( see 6 ) when tested in accordance with IS 2657 : 1964 for tensile test shall

satisfy the tensile properties requirements specified for the alloys in IS 737 : 1986.

### 7.3 Flattening Test

The flattening test shall be carried out in accordance with IS 2328 : 1983.

**7.3.1** A test piece not less than 50 mm long, cut from the selected tube shall be flattened. The weld bead position shall be equidistant from the flattening plates ( see Fig. 1 ).

**7.3.2** The test piece shall not crack in the wall or in the weld region during flattening until the interior surfaces of the tube meet under load.

### 7.4 Hydrostatic Pressure Test Requirement

Each tube shall withstand internal hydrostatic pressure of 2 000 kN/m<sup>2</sup> ( 20 kgf/cm<sup>2</sup> ) for one minute without evidence of leakage.

NOTE — If required, for specific applications, such as use of irrigation tubing in hilly terrain, the tube may be tested at 3 000 kN/m<sup>2</sup> ( 30 kgf/cm<sup>2</sup> ).

## 8 DIMENSIONS AND TOLERANCES

**8.1** The dimensions and tolerances of welded tubes used for irrigation purposes shall be as given in Table 1.

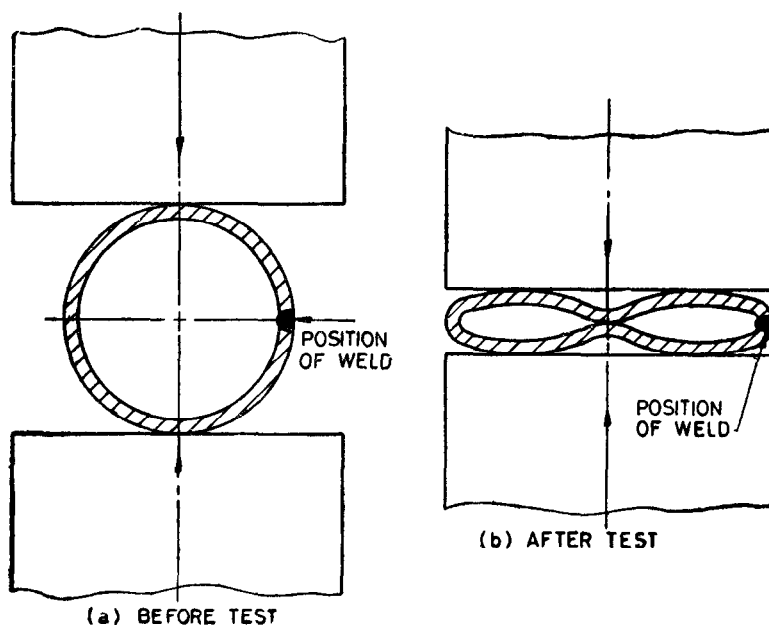
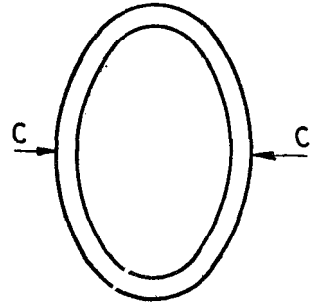
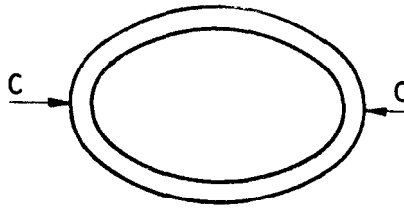
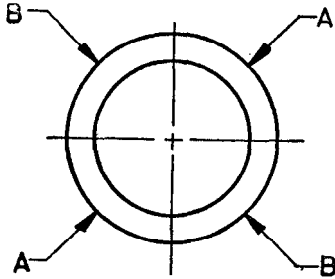


FIG. 1 POSITION OF WELD FOR FLATTENING TEST

Table 1 Dimensions and Tolerances for Welded Tubes

( Clause 8.1 )

All dimensions in millimetres.



| Nominal Size | Outside Diameter | Tolerance on Outside Diameter | Roundness or Ovality Tolerance on Outside Diameter | Wall Thickness Min |
|--------------|------------------|-------------------------------|----------------------------------------------------|--------------------|
| (1)          | (2)              | (3)                           | (4)                                                | (5)                |
| 50           | 50.8             | $\pm 0.40$                    | $\pm 0.75$                                         | 1.27               |
| 63           | 63.5             | $\pm 0.40$                    | $\pm 0.80$                                         | 1.27               |
| 75           | 76.2             | $\pm 0.40$                    | $\pm 0.90$                                         | 1.27               |
| 90           | 88.9             | $\pm 0.50$                    | $\pm 1.10$                                         | 1.27               |
| 100          | 101.6            | $\pm 0.65$                    | $\pm 1.25$                                         | 1.27               |
| 125          | 127.0            | $\pm 0.65$                    | $\pm 1.65$                                         | 1.32               |
| 150          | 152.4            | $\pm 0.90$                    | $\pm 1.90$                                         | 1.47               |
| 175          | 177.8            | $\pm 0.90$                    | $\pm 2.20$                                         | 1.63               |
| 200          | 203.2            | $\pm 1.15$                    | $\pm 2.55$                                         | 1.83               |

NOTE — Tolerances are applicable at the finished end of the tube.

**8.2** Unless otherwise agreed to, the length of each tube shall be 6 metres with a tolerance of  $\pm 1$  cm.

## 9 RETEST

### 9.1 Tensile Test and Flattening Test

If any one of the test pieces first selected fail to pass the tensile test and flattening test, two further samples from the same batch shall be selected for testing, one of which shall be from the tube from which the original test sample was taken unless that tube has been withdrawn by the supplier.

**9.1.1** If the test piece from either of these

additional samples fail, the batch represented by the test sample shall be deemed not to comply with this specification.

## 10 MARKING

**10.1** Each tube shall be suitably marked for identification with the logo/name of manufacturer or his trade-mark, month and year of manufacture and designation and temper of the alloy. If required the supplier shall furnish a certificate that the material supplied complies with the requirements of the specification.

**10.2** The tubes may also be marked with the Standard Mark.

### **Standard Mark**

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

### Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

### Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference:

Doc : No. MTD 7 ( 3519 )

### Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|-----------|---------------|---------------|
|           |               |               |
|           |               |               |
|           |               |               |
|           |               |               |

## BUREAU OF INDIAN STANDARDS

### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002  
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha  
( Common to all Offices )

### Regional Offices :

|                                                                                                                                                                         | Telephone                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg<br>NEW DELHI 110002                                                                                                   | { 331 01 31<br>331 13 75                        |
| Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola<br>CALCUTTA 700054                                                                                       | { 37 84 99, 37 85 61,<br>37 86 26, 37 86 62     |
| Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036                                                                                                                  | { 53 38 43, 53 16 40,<br>53 23 84               |
| Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113                                                                                                                | { 235 02 16, 235 04 42,<br>235 15 19, 235 23 15 |
| Western : Manakalaya, E9 MIDC, Marol, Andheri ( East )<br>BOMBAY 400093                                                                                                 | { 632 92 95, 632 78 58,<br>632 78 91, 632 78 92 |
| Branches : AHMADABAD, BANGALORE, BHOPAL, BHUBANESHWAR, COIMBATORE,<br>FARIDABAD, GHAZIABAD, GUWAHATI, HYDERABAD, JAIPUR, KANPUR,<br>LUCKNOW, PATNA, THIRUVANANTHAPURAM. |                                                 |